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A 2 x 2 x 2 x 2 factorial design was utilized to investigate the effects of race of expressor (black and white), sex of expressor, race of perceiver and sex of perceiver on perception of emotion (POE). Perception of seven emotions (anger, happiness, surprise, fear, disgust, pain, and sadness) was analyzed in terms of three dependent variables: (1) overall accuracy scores, (2) correct perception of individual emotions scores, and (3) erroneous perception of individual emotions scores. Perceivers consisted of 160 undergraduates. Expressors were 20 actors. Each perceiver matched photographs of expressors with one of the seven emotions. Results indicated significant main effects: (1) for the race of expressor, (whites were more accurately perceived than blacks); (2) for sex of expressor, (females were superior to males); (3) for race of perceiver, (blacks were superior to whites); and (4) nonsignificance for sex of the perceiver. Race differences in POE suggests that there may be differing cultural sensitivities to emotional nuances: i.e., black man's subservience may make him more "sensitive to the communicative symbols of action." (Dickey and Knower, 1941). (Author/LS)

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EXPRESSION AND PERCEPTION OF EMOTION: RACE AND SEX

A. George Gitter and Harvey Black

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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ABSTRACT

A 2x2x2x2 factorial design was utilized to investigate the effects of race of expressor (black and white), sex of expressor, race of perceiver, and sex of perceiver on perception of emotion (POE). Perception of seven emotions (anger, happiness, surprise, fear, disgust, pain, and sadness) was analyzed in terms of three dependent variables: (1) overall accuracy scores, (2) correct perception of individual emotions scores, and (3) erroneous perception of individual emotions scores. Overall results indicate significant main effects: (1) for race of expressor (whites were more accurately perceived than blacks), (2) for sex of expressor (females were superior to males), (3) for race of perceiver (blacks were superior to whites), and (4) nonsignificance for sex of perceiver.

PROBLEM

In 1872 Charles Darwin published the earliest recorded investigation of nonverbal communication (NVC) which focused on the perception of emotion (POE) in man. This investigation established that NVC, such as body movements, postures, facial expressions, and vocal inflections, are as important as verbal content in the perception of emotional states. Facial expressions and body movements have been the subject of research in psychology since the 1920's. Early research in NVC was concerned with the consistency between nonverbal and other aspects of expressive behavior. Recent research in NVC has been incorporated in studies of empathy, clinical judgment, psychotherapeutic situations, and communication theory (Ekman and Friesen, 1967). A major contention in theory and research has been that NVC and POE are intimately related.

Although POE research has continued since the time of Darwin it has been limited in scope and has failed to consider many relevant variables. Much of the early research, although recognizing race and sex differences in POE, has failed to consider <u>both</u> the race and sex of the perceiver <u>and</u> expressor.

This study is an attempt to relate NVC to perception of emotion. It will endeavor to simultaneously test a number of variables: race of expressor, sex of expressor, race of

perceiver, and sex of perceiver in terms of accuracy of perception as well as the patterning of correctly and erroneously perceived emotions.[1]

Perception of Emotion: Differences in Mode of Presentation

A review of the literature reveals that recognition of emotion studies employed a variety of stimuli. Research in the identification of a person's emotion employed as stimulus material: real people (Sherman, 1927; Meltzer and Thompson, 1964), still photographs of people (Darwin, 1872; Ruckmick, 1921; Schlosberg, 1952; Ekman, 1965; Gitter and Black, 1968; Kozel and Gitter, 1968), and drawings of people (Boring and Tichener, 1923). The specific emotion may be expressed in a natural state (Munn, 1940; Vinacke, 1949), or artificially created in a laboratory situation (Sherman, 1927; Meltzer and Thompson, 1964; Gitter and Black, 1968; Kozel and Gitter, 1968). Some researchers used recordings of a person's voice (Sherman, 1927b), and motion pictures of natural and artificial emotions (Coleman, 1949), while others have manipulated the various modes of presentation (Dusenbury and Knower, 1939; Kozel and Gitter, 1968).

It has been found in recent reviews of the literature (Davitz, 1964; Ekman, 1965; Bruner and Tagiuri, 1954) that the

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[1]An erroneously perceived emotion is one, which is, in fact, perceived when the perceiver did not correctly judge the emotion displayed by the expressor.

most popular stimulus employed in recognition of emotion studies has been posed photographs.

Factors Influencing the Perception of Emotion

It has been demonstrated that knowledge of the situation in question has influenced the findings in much of the POE research. Additional knowledge of the stimuli employed may increase the degree of success in identifying the various emotional states (Munn, 1940; Sherman, 1927), or may modify the interpretation of the stimulus (Carmichael, 1937). Hebb (1946) has pointed out that knowledge of the emotion preceding the expression which is to be judged may also influence the respondent.

Another factor which influenced the findings in studies of POE is that all emotions are not equally identifiable. Kellogg and Eagleson (1931) reported that the general order of perceptibility is laughter, pain, anger, fear, surprise, and scorn. Davitz (1964) also observed that success in identifying emotions was not uniform, e.g., anger was identified in 65% of the cases, while pride was identified less than 25% of the time. Davitz and Davitz (1959) found that expressors and perceivers were not equally skillful in the identification and expression of emotion.

Woodworth (1938) showed that expression of emotion could be arranged on a scale with six ordered categories: (1) mirth, (2) surprise, (3) fear, suffering, (4) anger, determination, (5) disgust, and (6) contempt. Use of this scale yielded a correlation of .92 between the intended pose and judgment of the perceivers.

Gitter and Black (1968) found the incidence of correct perception of emotion varied significantly with emotion; happiness and pain gave the highest, and fear and sadness the lowest proportion of correctly perceived emotion.

Perception and Expression of Emotion: Sex Differences

Bruner and Tagiuri (1954) concluded that there was conflicting evidence regarding sex differences in POE. Sherman (1927a) found that there were no sex differences in the ability to judge the emotional expressions of infants. Allport (1924) and Guilford (1929), utilizing the Rudolph series, reported no differences between males and females in their ability to judge emotion. Gates (1923) showed photographs of adult females, published by Ruckmick, to 458 children, ranging in age from 3 to 14. At ages 4, 5, and 9 the girls were slightly superior; at 5, 6, 7, and 8 the boys were superior judges. Coleman (1949), employing movies of laboratory-produced expressions of emotion, reported nc sex differences in responses.

There are, however, a number of studies that do report sex differences in POE. Buzby (1924) demonstrated that women were occasionally superior to men in their identification of some faces, whereas Kanner (1931) found that men were slightly superior. Jenness (1932) suggested that women judge facial expressions somewhat more intuitively than men because of the fact that, in his experiments, women made their judgments in half the time required

by the men. However Guilford (1929) did not find any evidence that women make their judgments in less time than men, nor that either sex makes more "intuitive judgments" than the other. Dusenbury and Knower (1938; 1939) demonstrated that women were better judges of emotion, regardless of the mode of presentation (i.e., motion picture or record). Kellogg (1931) found that Negro girls were consistently superior to Negro boys in POE. However, these findings were not consistent when the subjects were very young.

Vinacke (1949) found that females agreed more than males on the emotion expressed under face alone (just head) and situational conditions (same as face, but includes situational context). In another study, however, Vinacke and Fong (1955) found little or no difference in judgments between sexes for the face-alone condition, but in the situational condition the results were similar to previous findings, that is, females agreed more on the nature of the expression. Kozel and Gitter (1968) found significant differences in sex of perceiver in overall POE; females were superior to males in their overall perception of emotion.

Jenness (1932), in a study which employed only male expressors, stated that the addition of female expressors might have an effect on the distribution of the scores. In an investigation of the possible personality correlates effecting the ability to enact emotions through facial expressions, Meltzer and Thompson (1964)

found that there were no correlates except a general superiority of male over female expressors. In replicating the Meltzer and Thompson study, however, Drag and Shaw (1967) reported a trend which found that females were superior as expressors of emotion. In fact, females were particularly successful in the expression of happiness, love, fear and anger. The authors explain these findings by assuming that these emotions are characteristic of the female role and that the expression of emotion may be a function of practice.

Gitter and Black (1968) found that sex of the expressor significantly interacts with the pattern of correctly perceived emotion, i.e., surprise and fear are more correctly perceived when the expressors are females rather than males.

In summary, although there is conflicting data, it appears that in the perception and expression of emotion, females tend to be slightly superior to their male counterparts.

Perception and Expression of Emotion: Race Differences

Anthropological studies have emphasized national and racial differences in the expression of emotion. Gorer (1935) noted that in Africa:

> . . .Laughter is used by the Negro to express surprise, wonder, embarrassment, and even discomfiture; it is not necessarily or even often a sign of amusement; the significance given to "black laughter" is due to a mistake of supposing that similar symbols have identical meanings.

According to Reusch, (1961) the primary function of

emotional expression is that of a universal and international emergency language. He claims that anxious trembling or cries of fear are correctly perceived throughout the world; tears are interpreted as a release of tension attributed to moments of grief, pleasure, or pain. Klineberg (1935) stated, however, that in the expression of emotion, and in the interpretation of an emotional expression, there are national and racial differences.

Although these qualitative descriptions point to the possible differences existing between blacks and whites in the perception and expression of emotion, there has been little empirical evidence gathered which illustrates the strength and scope of these differences. There have been studies, however, which attempted to test the effects of national differences in POE. Dickey and Knower (1941) showed American and Mexican high school students pictures of a man and woman in different emotional states. The Mexican children were significantly more accurate in judging 10 out of the 11 emotions. Dickey and Knower concluded that these differences in correct POE were the result of a greater sensitivity on the part of the Mexicans to the communicative symbols of action.

In an investigation designed to demonstrate differences that might exist between Oriental and Caucasian college students, Vinacke (1949) had Japanese, Chinese, and Caucasian subjects judge candid camera facial expressions of 20 Caucasians. Vinacke found that racial groups display the same patterning of interpreting the facial expressions of Caucasians; however, each racial group displayed more

agreement than the other two on the different emotional expressions. Vinacke and Fong (1955) found that Orientals agreed more on judgments of Oriental expressions than did Caucasians.

Recently, investigators have been concerned with race differences in expression and perception of emotion. Kozel and Gitter (1968), in a study designed to test the effect of race of expressor on POE, utilized ten female expressors (five white and five black) enacting seven emotions. They found contradicting results for main effect of race of expressor; blacks were more accurately perceived in the expression of the emotions of anger and pain, whereas whites were more accurately perceived when expressing fear and happiness.

In an investigation designed to test the effect of race and sex of perceiver, and race and sex of expressor enacting seven emotions, Gitter and Black (1968) found race of perceiver significantly related to overall POE; Negro perceivers were more accurate in the perception of emotion than their white counterparts. This study of college undergraduates found that the race of perceiver significantly influenced the accuracy of perceiving the seven individual emotions. It also revealed that the race of perceiver significantly influenced the incidence of erroneous perception of the seven emotions; white subjects exhibited a higher rate of erroneously perceived emotions.

Although the literature search yielded only one study utilizing both sex and race of both perceiver and expressor as

variables within a single study, it was nevertheless demonstrated that race and sex have been related to perception of emotion. Many of the POE studies were limited because of contradictory results, a lack of experimental rigor, the absence of tests of significance, and the failure to investigate additional operative variables. This study will attempt to add to the clarity of the previously investigated variables of race and sex of expressor, as well as test the effect of the race and sex of perceiver.

Based on evidence from previous investigations, it was predicted that females would perceive emotional expressions with significantly greater accuracy than males (Jenness, 1932, Dusenbury and Knower, 1937, 1939; Vinacke, 1949; Vinacke and Fong, 1955; Kozel and Gitter, 1968). It was predicted that blacks would perceive emotional expressions better than whites (Dickey and Knower, 1947; Vinacke and Fong, 1955; Gitter and Black, 1968). No directional hypotheses were postulated regarding the effects of race or sex of expressor because of the scarcity of empirical data concerning these two variables.

METHOD

The four independent variables were: Race of expressor (black and white); sex of expressor; race of perceiver and sex of perceiver. A 2x2x2x2 factorial design (below) was employed.

Experimental Design Diagram

1	Race of Expressor (R of E)	W								B							
2	Sex of Expressor (S of E)	M				F				M				F			
3	Race of Perceiver (R of P)	W		B		W		B		W		B		W		B	
4	Sex of Perceiver (S of P)	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
5	N(for perceivers in each treatment group)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Group #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

W= White B = Black M = Male F = Female

Subjects

One hundred sixty (160) volunteer Boston University undergraduates made up the sample of perceivers (for the sex and race breakdown of the sample see Experimental Design Diagram).

Expressors

The twenty (20) expressors were professional actors (10 white and 10 black; 5 male and 5 female of each race--rows #1 and 2 of Experimental Design Diagram), from the Harvard Summer Players and the People's Theatre of Cambridge. Each expressor

was photographed with a 16mm Auricon sound motion picture camera (black and white film) while enacting seven (7) emotions: anger, happiness, surprise, fear, disgust, pain and sadness.

In order to keep all extraneous variables constant, the expressors were filmed while seated, facing 45° away from the camera, as if they were interacting with another person out of view of the camera. Each expressor was filmed at 3/4 full figure. The background and lighting were kept constant in all cases and no changes were made in any way to alter the appearance between portrayals of emotion. Unlimited retakes were shot whenever the director or the expressors were dissatisfied with the particular sequence.

As each actor portrayed a particular emotion, they recited the same monologue: "Where are you, what are you doing," thus maintaining the semantic content constant across all experimental groups.

After the films were processed, 3"x5" photographic pictures were made of each person going through each of the various emotions. In order to make the stills, the scenes were shown to 3 graduate student judges on a Moviola manual viewing machine and judgments were made as to the point in the film which was most typical of the particular emotion. When agreement was reached, the appropriate frame was marked and black and white photographs were made. The set of stills consisted of 140 enlargements (20 expressors

x seven emotions). Ss in Groups #1-4 were shown the 35 photographs of white male expressors, Groups #5-8 saw the 35 photographs of white female expressors, Groups #9-12 saw black male expressors, and Groups #13-16 saw black female expressors.

Procedure

The perceivers in this study, the 160 undergraduates, were individually tested; white and black Ss were tested by a member of their own race. Each S saw 35 pictures presented individually, in random order (5 expressors portraying seven different emotions). Each S was given written instructions (see Appendix A) which explained the judgmental task. The Ss were asked to match each photograph with one of the seven emotions. The names of the seven emotions were handed to each S on separate slips of paper (randomized for each S).

RESULTS

Subjects' responses were coded:

1. as to whether they were correct or incorrect, that is, whether the emotion perceived corresponded to the emotion portrayed, and
2. where incorrect, what emotion was in fact perceived.

Thus the analysis involved three types of dependent variable scores: 1. total accuracy scores; 2. correctly perceived scores for each emotion, and 3. erroneously perceived scores for each emotion. The sequence of results to be presented corresponds to the three types of scores used in the analysis; first, overall accuracy in POE, second, patterning of correctly perceived individual emotions, and third, patterning of erroneously perceived individual emotions.

Overall Accuracy Scores

Results of a 4-way analysis of variance, employing overall accuracy scores as dependent variable data, indicate that race of expressor is significantly related to overall POE (main effect for R of E[1] -- $F=7.127$, $df=1/144$, $p<.01$).

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[1] R of E denotes race of expressor; S of E denotes sex of expressor; R of P denotes race of perceiver; S of P denotes sex of perceiver.

White expressors were judged more accurately than black ones. Overall accuracy of POE was also related to the sex of expressor; female expressors were judged more accurately than male ones (main effect for S of E -- 17.600, df=1/144, $p<.001$). In addition, race of perceiver was significantly related to overall POE; black perceivers were more accurate than their white counterparts (main effect for R of P -- F=6.384, df=1/144, $p<.05$). Sex of perceiver did not significantly influence the overall POE (F=2.472, df=1/144, N.S.).

Interaction between sex of expressor and race of perceiver was significant (interaction effect for S of E and R of P -- F=6.384, df=1/144, $p<.05$). White male expressors were perceived by blacks and whites with the same degree of accuracy, while female expressors were judged more accurately by black perceivers (Figure 1).

FIGURE 1

Race of Perceiver x Sex of Expressor for Overall Accuracy of POE

There was also significant higher order interactions between R of E, S of E and S of P ($F=6.875$, $df=1/144$, $p<.01$), and between R of E, S of E, R of P and S of P ($F=22.268$, $df=1/144$, $p<.001$).

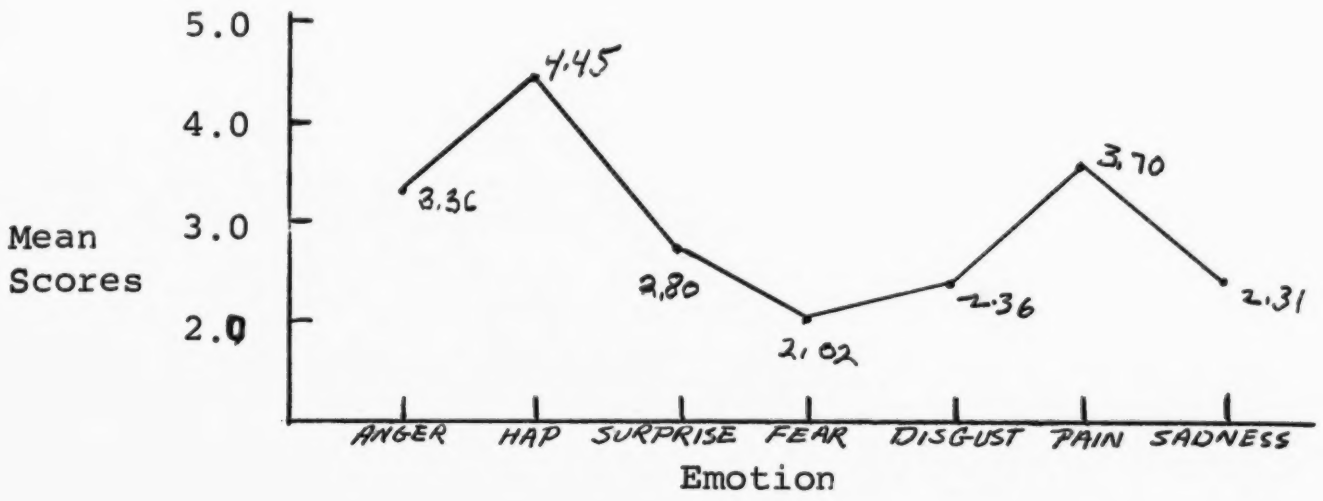
Patterns of Correctly Perceived Emotions

Results of a 3-way Anova with repeated measures, utilizing the number of correct scores for each of the seven emotions as repeated measures, indicated that race of expressor significantly (main effect for R of E -- $F=6.567$, $df=1/152$, $p<.05$) influenced the accuracy of perceiving the seven emotions; whites were seen more accurately than blacks. Sex of expressor significantly (main effect for S of E -- $F=16.543$, $df=1/152$, $p<.001$) influenced the accuracy of perceiving the seven emotions; females were seen more accurately than males. Black perceivers were more accurate in judging the seven emotions (main effect for R of P -- $F=6.567$, $df=1/152$, $p<.05$) than their white counterparts. Sex pf perceiver did not significantly influence correct POE (main effect for S of P--$F=2.155$, $df=1/152$, $p>.05$).

The incidence of correct POE varied significantly ($F=127.641$, $df=6/912$, $p<.001$) with emotion; happiness and pain gave the highest, while fear, disgust and sadness the lowest proportions of correctly perceived emotions (Figure 2).

FIGURE 2

Correct Perception of Emotion



Race of expressor significantly interacted (F=4.874, df=6/912, p<.001) with the pattern of correctly perceived emotions. (Figure 3). White expressors were judged more accurately, except for pain,where black expressors were perceived more accurately.

Analysis of correct POE data in terms of sex of expressor and pattern of correctly perceived emotions indicated a significant (F=34.980, df=6/912, p<.001) interaction between sex of expressor and the perception of the various emotions. Anger, surprise, and fear were more accurately judged when the expressors were females, while male expressors led to more correct judgments with sadness, pain, and disgust (Figure 4).

FIGURE 3

Correct Perception of Emotion: Race of Expressor x Emotion

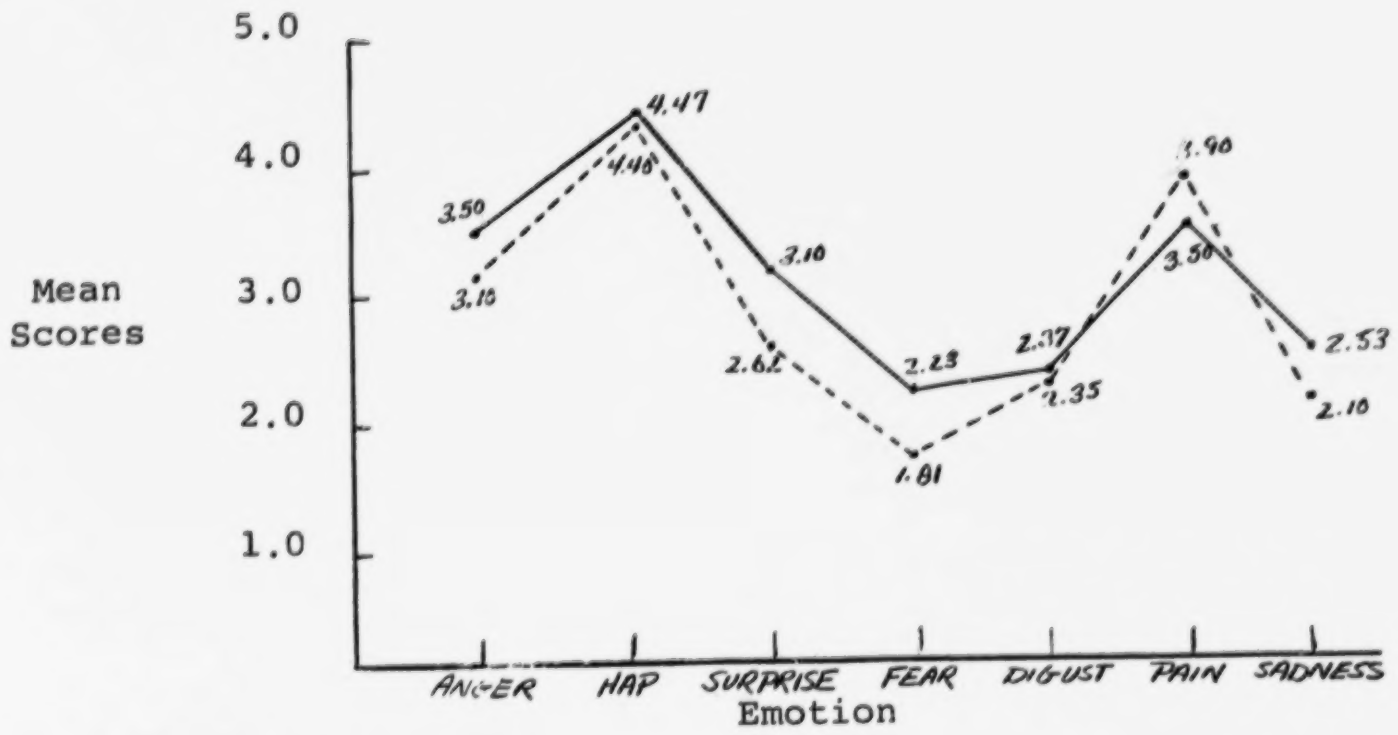
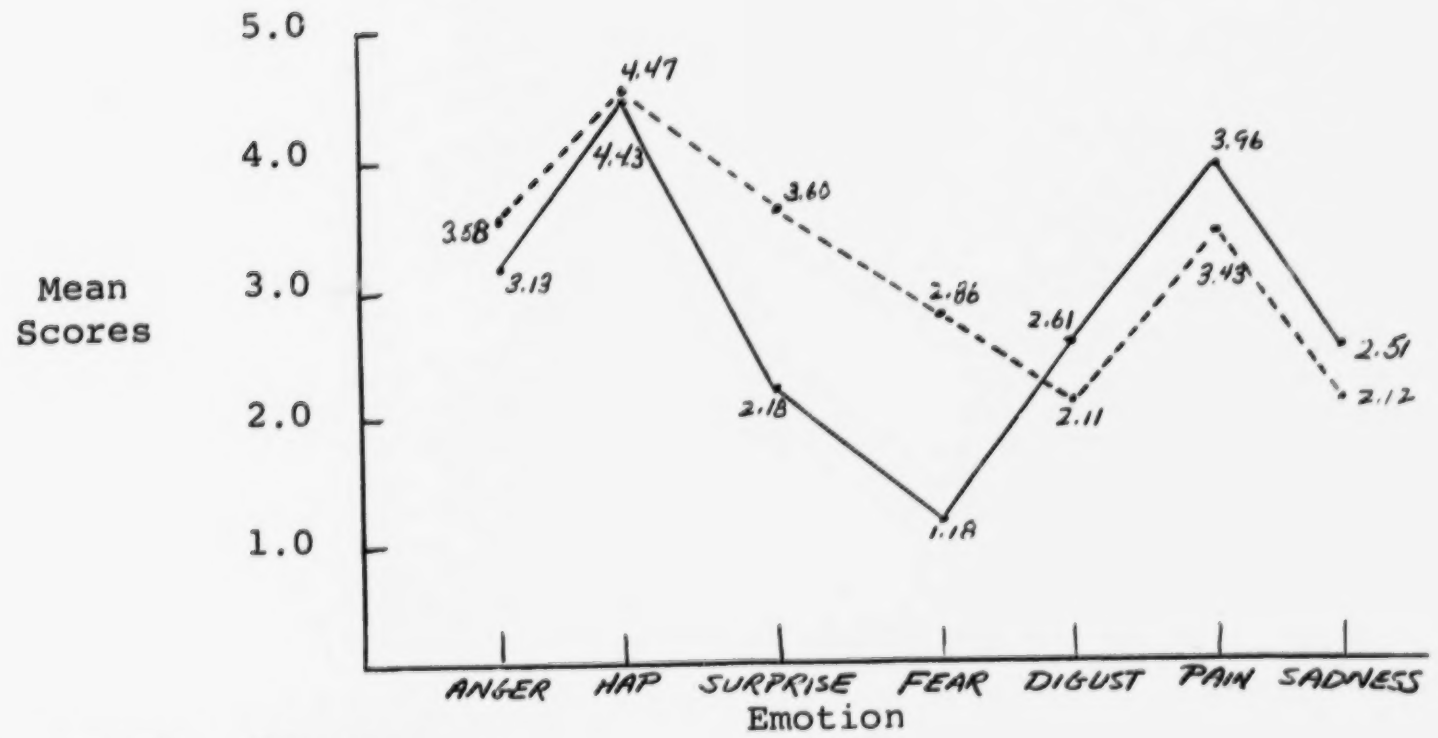


FIGURE 4

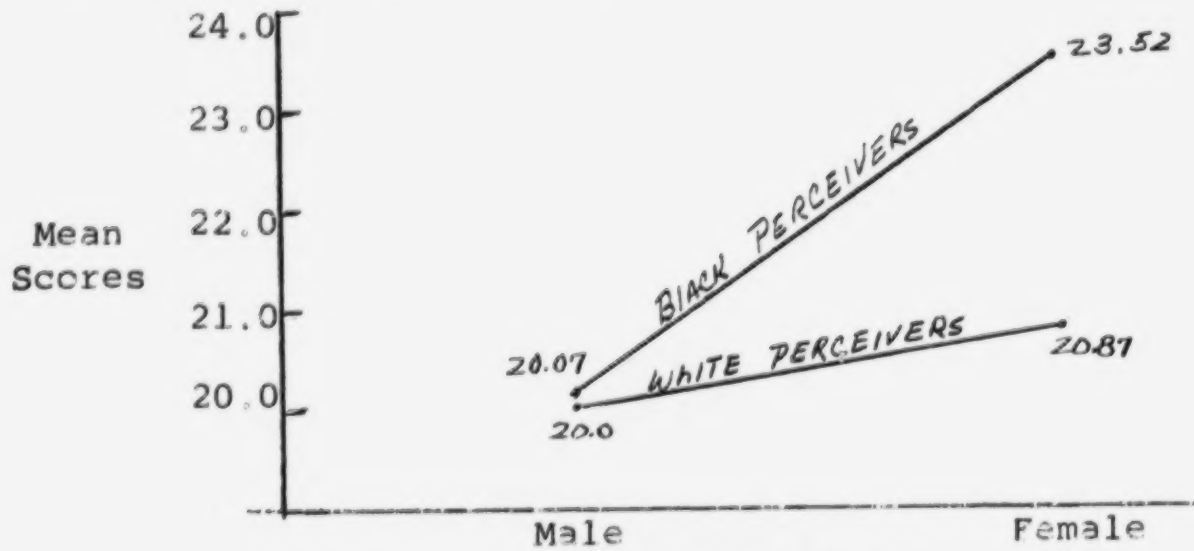
Correct Perception of Emotion: Sex of Expressor x Emotion



Significant interaction (F=5.864, df=1/152, p<.05) results between sex of expressor and race of perceiver indicated that, although both races perceived males with less accuracy, blacks were significantly more accurate when judging the female expressors than when judging male ones (Figure 5).

FIGURE 5

Race of Perceiver x Sex of Expressor



There were also significant higher order interactions: (1) between race of expressor, sex of expressor, and sex of perceiver (F=6.934, df=1/152, p<.01), (2) between race of expressor, sex of expressor, and emotion (F=7.710, df=6/912, p<.001), and (3) between race of expressor, sex of expressor, race of perceiver, and emotion (F=168.468, df=6/912, p<.001).

Correct Perception of Individual Emotions

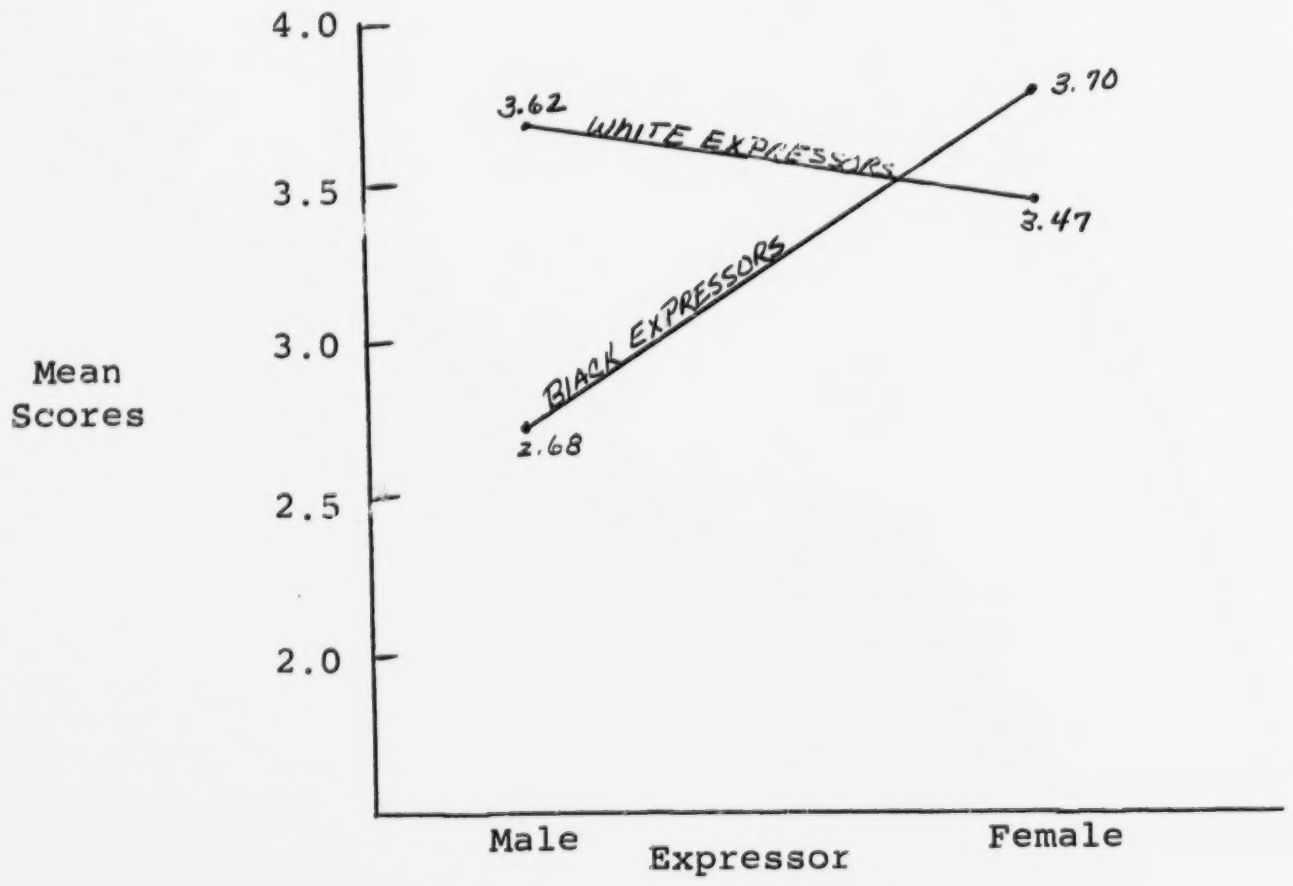
Anger. Expressing anger, white expressors were perceived

with significantly higher accuracy than their black counterparts (main effect for R of E -- $F=5.617$, $df=1/172$, $p<.05$). Sex of expressor was found to be significant; females were perceived more accurately expressing anger than males (main effect for S of E -- $F=8.089$, $df=1/72$, $p<.01$).

There was a significant ($F=14.380$, $df=1/72$, $p<.001$) interaction between race of expressor and sex of expressor; black females were perceived more accurately than black males, whereas white males were perceived more accurately than white females (Figure 6).

FIGURE 6

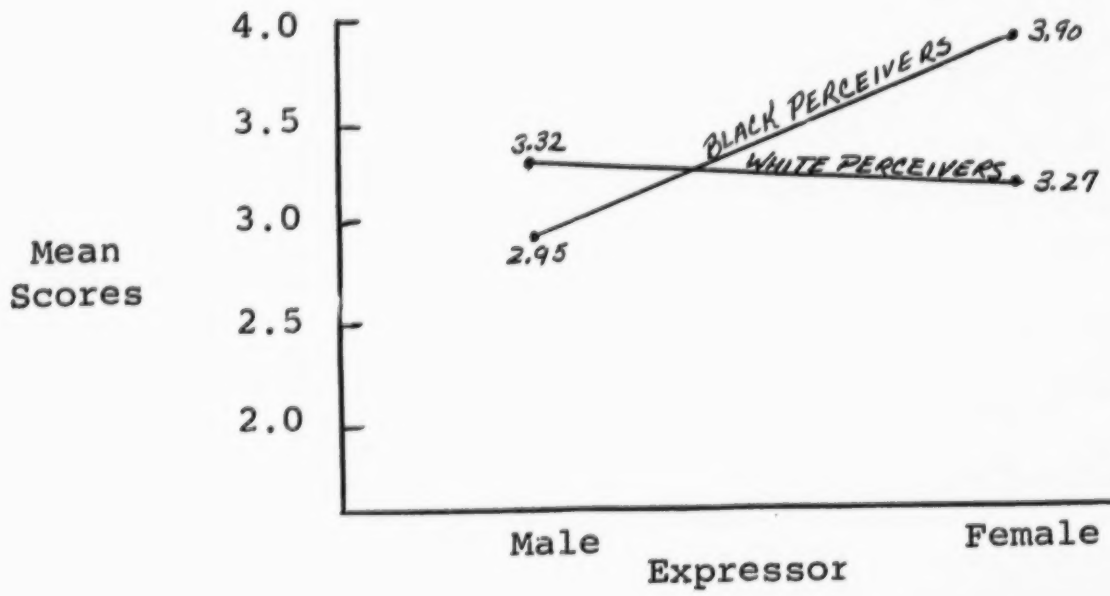
Race of Expressor x Sex of Expressor for Correct POE--Anger



Interaction between sex of expressor and race of perceiver was significant ($F=9.986$, $df=1/72$, $p<.01$). Black perceivers were more accurate when judging female expressors than when judging male expressors, whereas white perceivers were more accurate in their perception of males rather than females (Figure 7).

FIGURE 7

Sex of Expressor x Race of Perceiver for Correct POE--Anger



There were also significant higher order interactions: (1) between race of expressor, sex of expressor, and sex of perceiver ($F=4.895$, $df=1/72$, $p<.05$), and (2) between race of expressor, sex of expressor, race of perceiver, and sex of perceiver ($F=8.416$, $df=1/72$, $p<.01$).

Happiness. There was only a higher order significant interaction between race of expressor, sex of expressor, and race of perceiver ($F=4.361$, $df=1/72$, $p<.05$), in the correct perception of happiness.

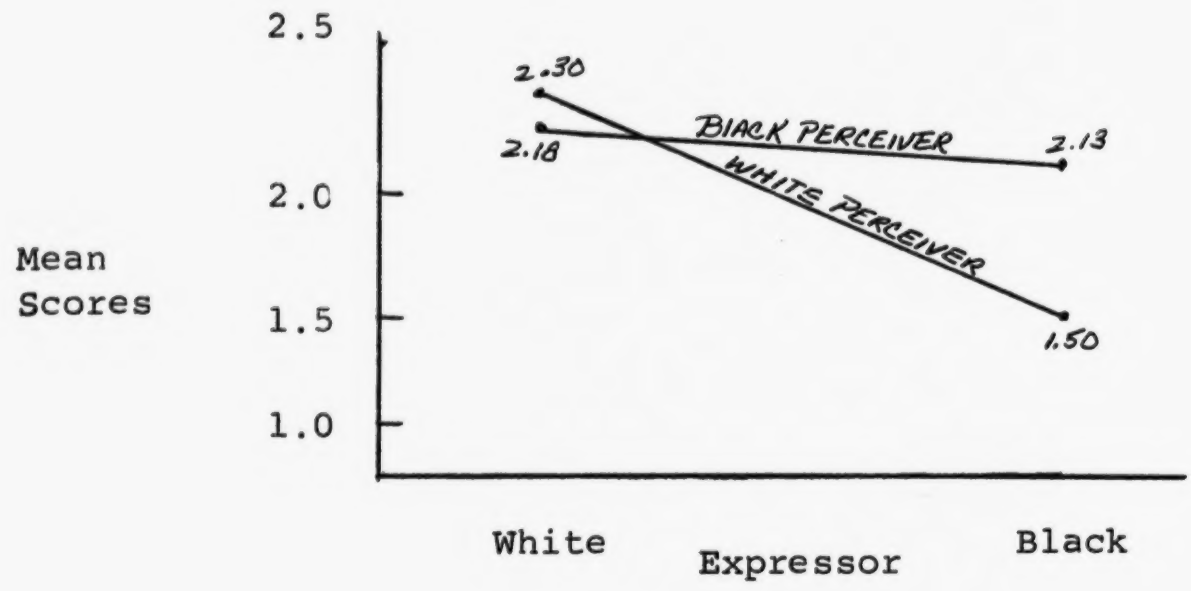
Surprise. When the emotion of surprise was expressed, there was a significant difference between black and white expressors; whites were significantly better than blacks in expressing surprise (main effect for R of E -- $F=11.613$, $df=1/72$, $p<.01$). Sex of expressor was significant ($F=80.196$, $df=1/72$, $p<.001$) in perception of surprise; female expressors were better expressors of surprise than their male counterparts. There was also a significant higher order interaction between race of expressor, sex of expressor, race of perceiver, and sex of perceiver ($F= 85.753$, $df=1/72$, $p<.001$).

Fear. White expressors were correctly perceived enacting fear significantly more than their black counterparts (main effect for R of E -- $F=7.918$, $df=1/72$, $p<.01$). Females were significantly better than males in expressing fear (main effect for S of E -- $F=122.986$, $df=1/72$, $p<.001$).

A significant interaction between race of expressor and race of perceiver ($F= 6.164$, $df=1/72$, $p<.05$) indicated that whites were more accurate when viewing white expressors than when judging black expressors of fear, whereas black perceivers view white and black expressors with about the same degree of accuracy (Figure 8).

FIGURE 8

Race of Perceiver x Race of Expressor--Fear



There was also a significant ($F=103.192$, $df=1/72$, $p<.001$) higher order interaction between race of expressor, sex of expressor, race of perceiver, and sex of perceiver.

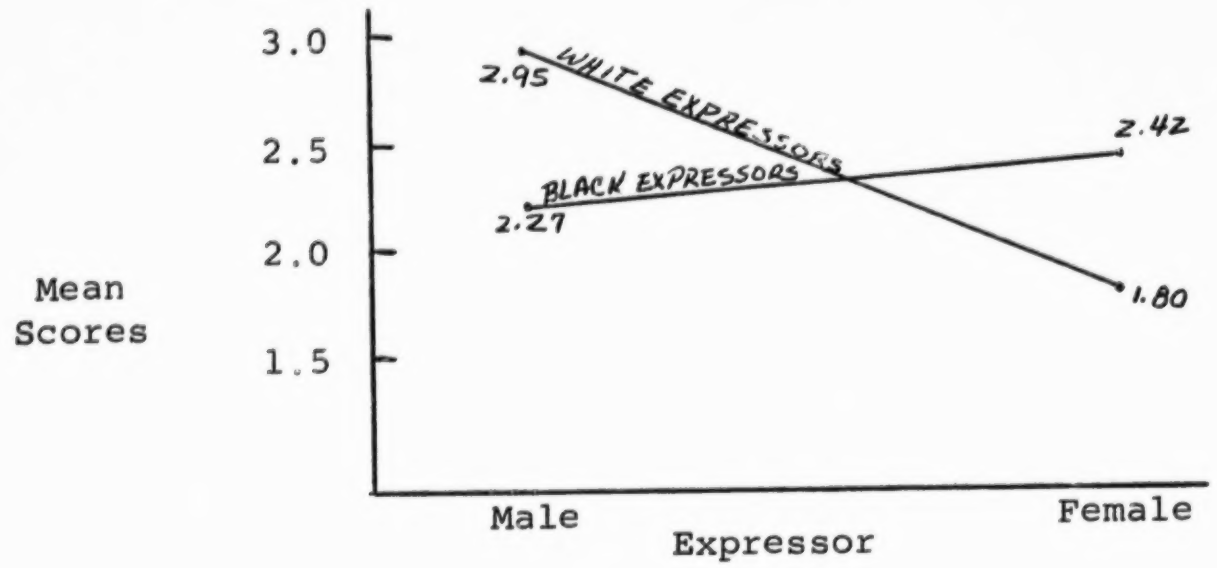
Disgust. The accurate expression of disgust by males was significantly better than that by females (main effect for S of E -- $F=7.676$, $df=1/72$, $p<.01$). Black perceivers were significantly better than whites when judging disgust (main effect R of P -- $F=5.546$, $df=1/72$, $p<.05$).

A significant interaction effect ($F=12.972$, $df=1/72$, $p<.001$) between race of expressor and sex of expressor indicated that white males were seen more accurately than white

females, while black females were seen more accurately than black males (Figure 9).

Figure 9

Race of Expressor x Sex of Expressor--Disgust



There was a significant (F=8.633, df=1/72, p<.01) higher order interaction between race of expressor, sex of expressor, race of perceiver, and sex of perceiver.

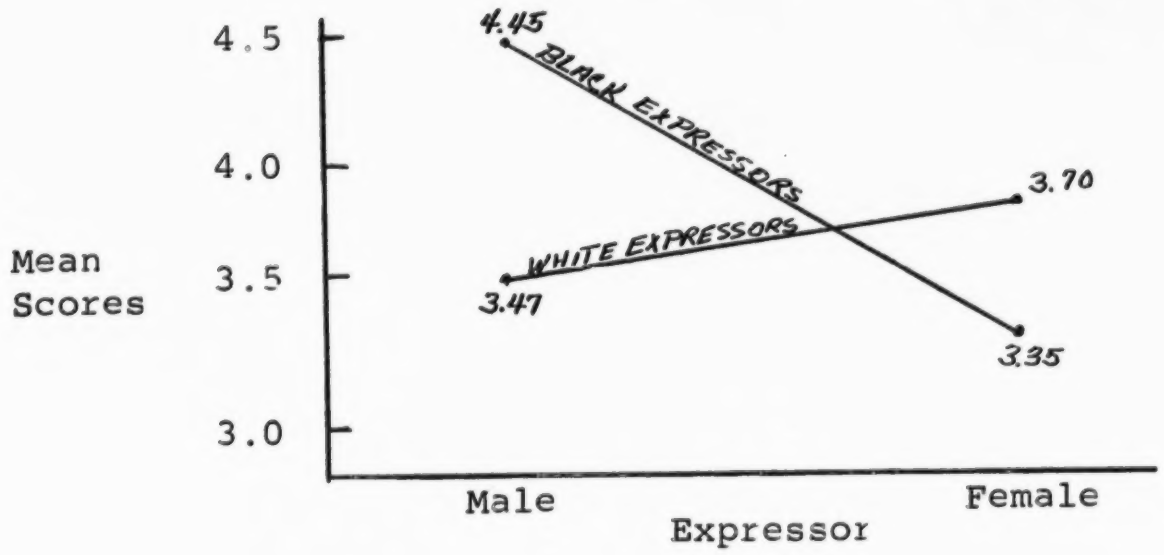
Pain. Significant main effect for race of expressor reflected a greater accuracy on the part of blacks in expressing pain (F=5.364, df=1/72, p<.05). The effect of sex of expressor was significant (main effect for S of E -- F=9.241, df=1/72, p<.01) in expressing pain; males were judged with a higher rate of accuracy than female expressors.

Interaction between race of expressor, and sex of expressor produced a significant difference in the judgment of pain (F=11.085, df=1/72, p<.01). Black males were judged more

accurately than black females, while white females were seen more accurately than white males expressing pain (Figure 10).

Figure 10

Race of Expressor x Sex of Expressor--Pain



There was a significant higher order interaction between race of expressor, sex of expressor, race of perceiver, and sex of perceiver ($F=13.809$, $df=1/72$, $p<.001$).

Sadness. White expressors were perceived more accurately enacting sadness (main effect for R of E -- $F=5.751$, $df=1/72$, $p<.05$). There was significant main effect for sex of expressor ($F=4.512$, $df=1/72$, $p<.05$); sadness was judged significantly better when the expressors were males. There was also a significant higher order interaction between race of expressor, sex of expressor, race of perceiver and sex of perceiver ($F=4.902$, $df=1/72$, $p<.05$).

Summary. Differences associated with race of expressor, sex of expressor, race of perceiver and sex of perceiver for overall correct and for the individual emotions are summarized in Table 1.

TABLE 1

Level of Significant Differences
in Accuracy of POE

Emotion	A*	B	C	D	AB	AC	AD	BC	BD	CD	ABC	ABD	ACD	BCD	ABCD
Total	.01	.001	.05					.05				.01			.001
Anger	.05	.01			.001			.01				.05			.01
Happiness											.05				
Surprise	.01	.001													.001
Fear	.01	.001				.05									.001
Disgust		.01	.05		.001							.05			.01
Pain	.05	.01			.01										.001
Sadness	.05	.05													.05

*A - Race of Expressor
B - Sex of Expressor
C - Race of Perceiver
D - Sex of Perceiver

The effect of race of expressor was significant, not only in terms of overall accuracy scores but also for five of the seven emotions. White expressors were superior to blacks in total accuracy and the expression of anger, surprise, fear, and sadness; the opposite was true for pain, where blacks were superior to their white counterparts.

Sex of expressor was an extremely potent independent variable. Females were superior to males in overall accuracy, as well as in the expression of anger, surprise, and fear.

Males, however, were significantly more successful in portraying disgust, pain,and sadness.

Race of perceiver led to significant differences both in terms of overall accuracy, and in the perception of disgust, where black perceivers were more accurate than their white counterparts.

No significant differences were found for sex of perceiver.

Race of expressor interacting with sex of expressor was found significant in the judgment of anger, disgust, and pain. There was a significant interaction of race of expressor and race of perceiver in the enactment of fear; black perceivers judged white and black expressors with the same degree of accuracy, while white perceivers were more accurate in their perception of white expressors. Sex of expressor interacting with race of perceiver was found significant in total accuracy as well as correct perception of anger.

Patterns of Erroneously Perceived Emotions

An erroneously perceived emotion is one which was, in fact, perceived when the perceiver did not correctly judge the emotion portrayed by the expressor. As with the pattern of correctly perceived emotions, a 3-way Anova with repeated measures, utilizing the incidence of erroneous perception for the various emotions as data for the repeated measures, was

performed.

Results of this analysis indicated that race of expressor significantly ($F=6.817$, $df=1/152$, $p<.05$) influenced the incidence of erroneous perception of the seven emotions; judgments of black expressors accounted for a higher degree of erroneous POE than those of whites.

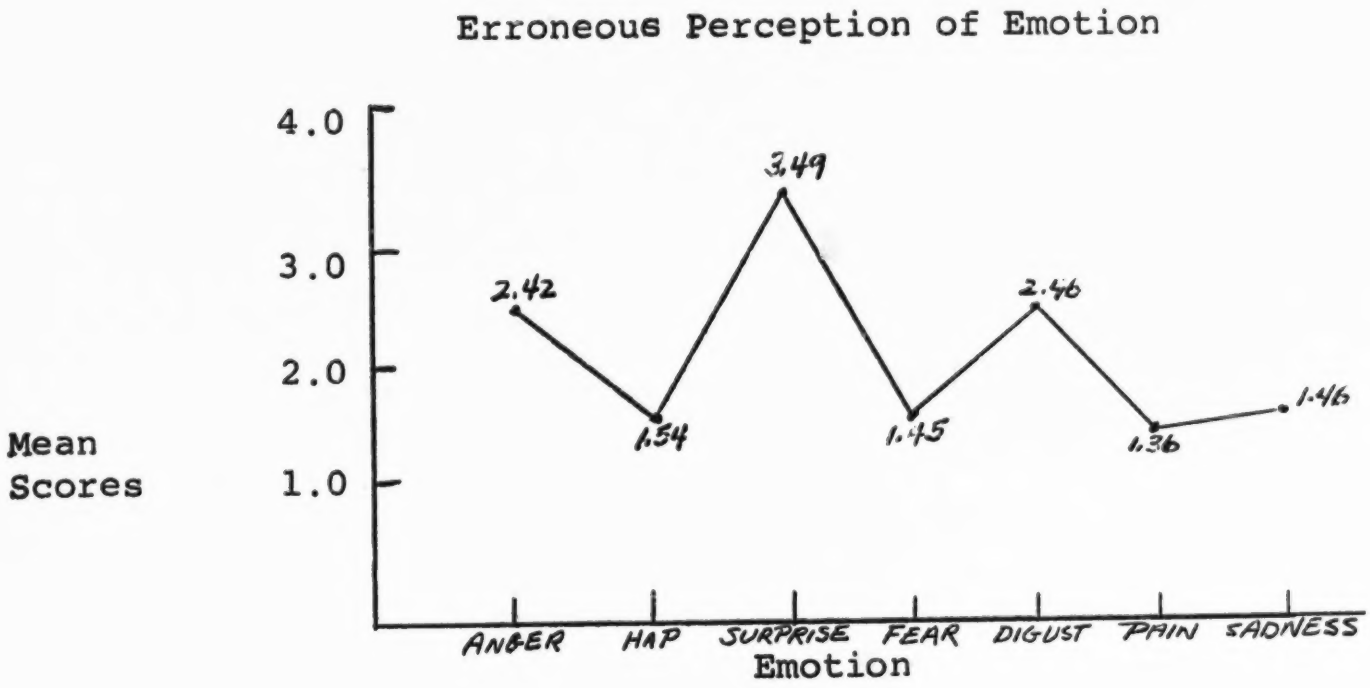
Sex of expressor significantly(main effect for S of E -- $F=17.335$, $df=1/152$, $p<.001$) influenced the erroneous perception of the various emotions. Male expressors contributed more than females to erroneous POE.

Race of perceiver significantly ($F=6.335$, $df=1/152$, $p<.05$) influenced the incidence of erroneous perception of the seven emotions; white perceivers were responsible for a higher degree of erroneous POE than black perceivers.

The incidence of erroneous perception varied significantly ($F=42.260$, $df=1/152$, $p<.001$) with emotion. Surprise and disgust comprised the highest proportion of erroneously perceived emotions whereas pain, fear and sadness accounted for the lowest proportions of erroneously perceived emotions (Figure 11).

Sex of perceiver did not significantly influence the overall erroneous POE in terms of main effect ($F=2.444$, $df=1/152$, N.S).

FIGURE 11



Male expressors accounted for more overall erroneous POE than females. However, white perceivers erroneously judged female expressors significantly more than did black perceivers (interaction effect between S of E and R of P -- $F=5.870$, $df=1/152$, $p<.05$) (Figure 12).

Race of expressor significantly interacted ($F=3.283$, $df=6/912$, $p<.01$) with the pattern of erroneous POE--surprise and pain had a higher incidence of erroneous perception when the expressors were white as compared to black ones (Figure 13).

Sex of expressor significantly interacted ($F=9.032$, $df=6/912$, $p<.001$) with the overall pattern of erroneous POE (Figure 14)--anger, surprise and disgust had a higher incidence of erroneous POE when the expressors were male as compared to female ones.

FIGURE 12

Erroneous POE--Sex of Expressor x Race of Perceiver

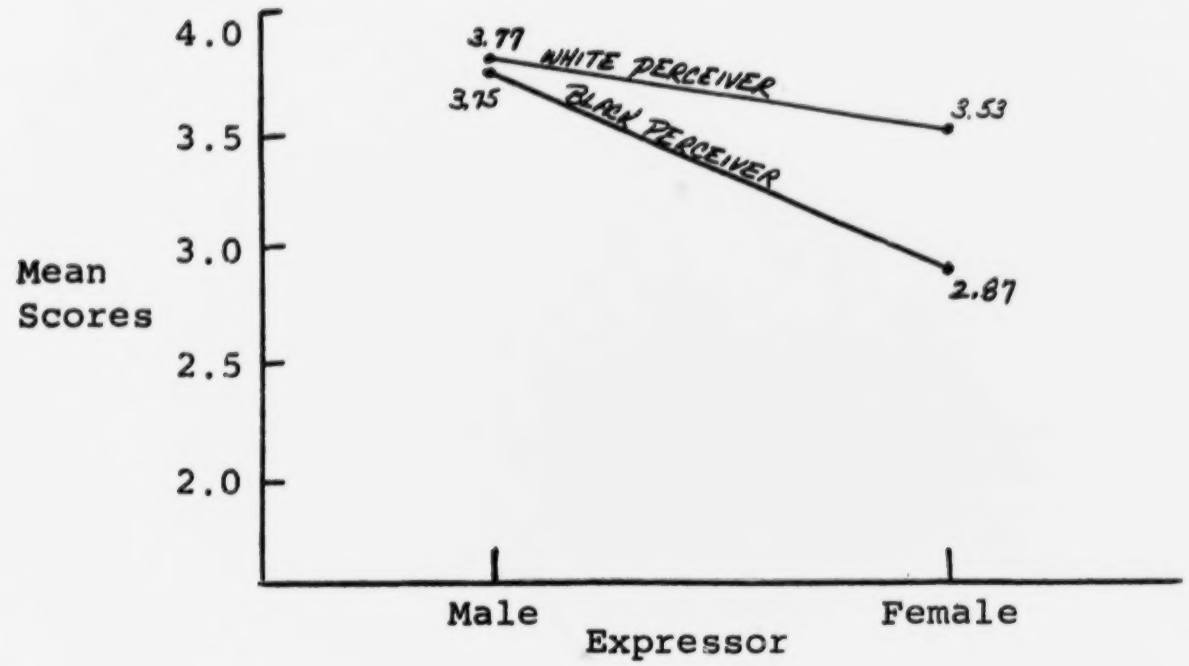


FIGURE 13

Erroneous Perception of Emotion: Race of Expressor x Emotion

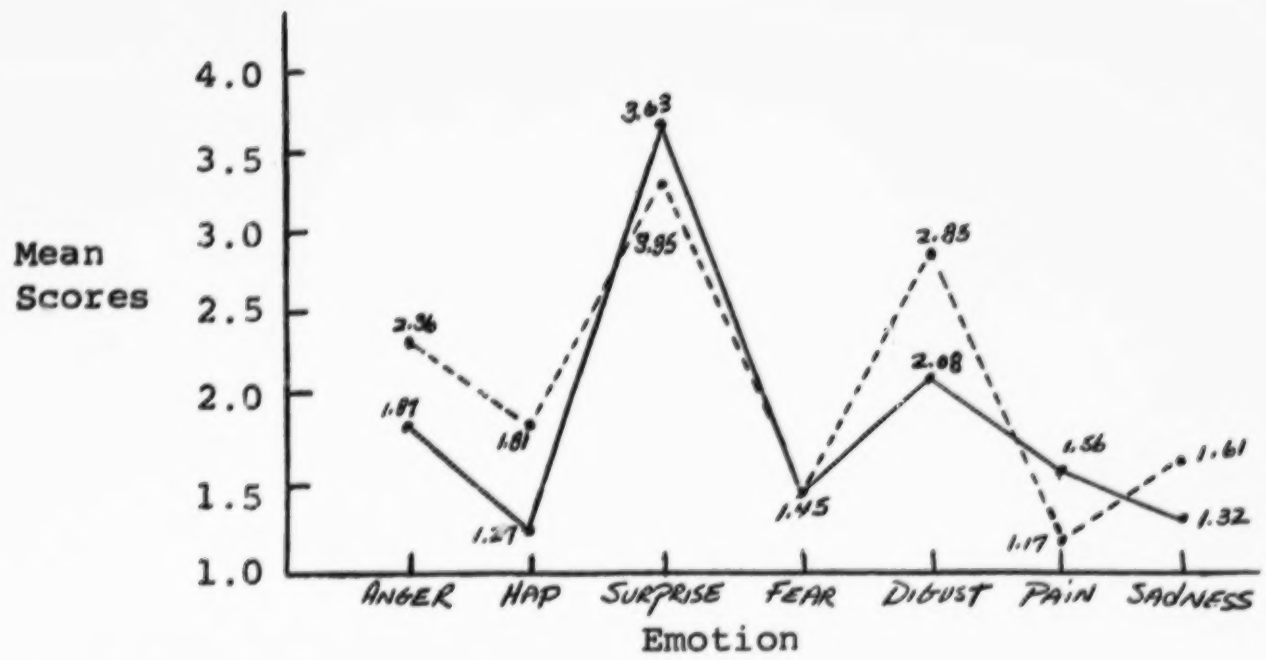
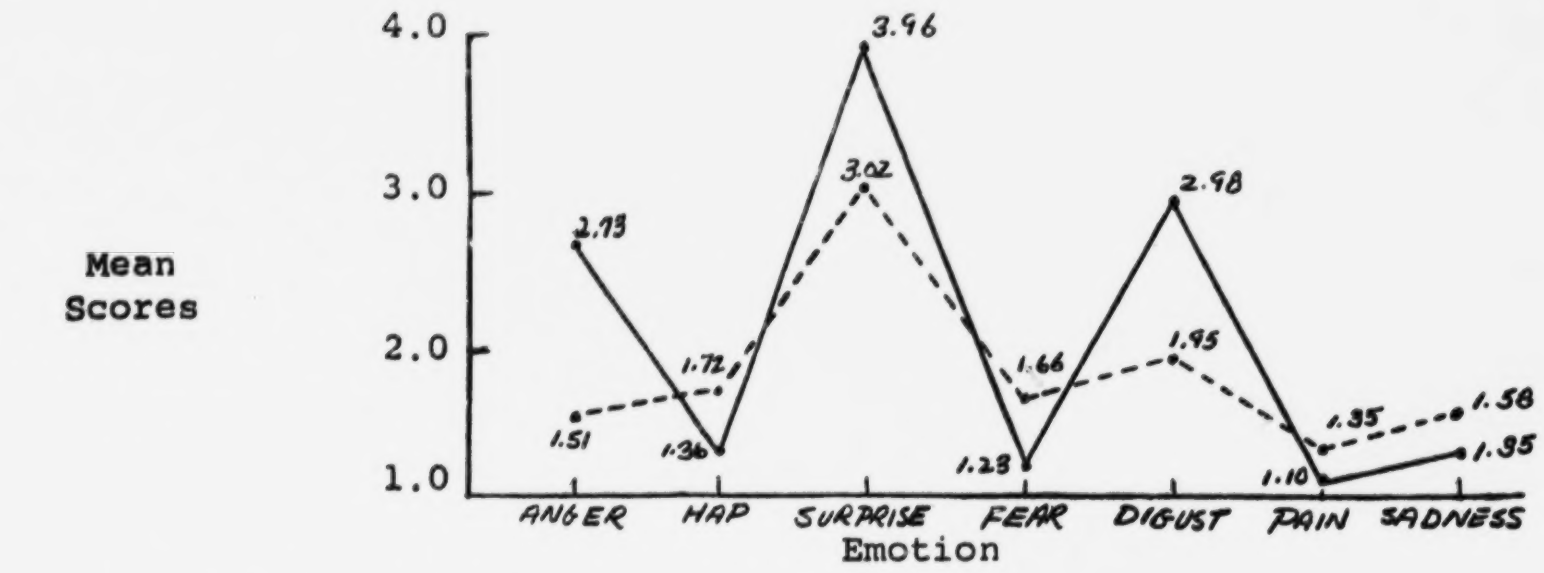


FIGURE 14

Erroneous Perception of Emotion: Sex of Expressor x Emotion



There were a number of significant higher order interactions: (1) between race of expressor, sex of expressor and emotion ($F=2.261$, $df=6/912$, $p<.05$); (2) between sex of expressor, race of perceiver, and emotion ($F=3.245$, $df=6/912$, $p<.01$); (3) between race of expressor, sex of expressor and sex of perceiver ($F=6.707$, $df=1/152$, $p<.05$); (4) between race of expressor, sex of expressor, race of perceiver, and emotion ($F=53.770$, $df=6/912$, $p<.001$); and (5) between race of expressor, sex of expressor, sex of perceiver and emotion ($F=54.494$, $df=6/912$, $p<.001$).

Race of expressor was significant in the erroneous perception of emotion as it was for the results of correct POE. In the case of erroneous POE, the trend encountered in the results for correct POE was reversed. Black expressors were responsible for a higher rate of erroneous judgment than whites. This reversal was also true of sex of expressor and

race of perceiver. Male expressors contributed more than females to the erroneous POE, and white perceivers were responsible for a higher rate of erroneous judgment than their black counterparts. As with correct POE, analysis of erroneous perception also indicated that the incidence of erroneous perception varied significantly with emotion.

DISCUSSION

Results of this investigation demonstrate that race of expressor, sex of expressor, race of perceiver and the nature of the emotion have an influence on POE from posed photographs.

The effect of race of expressor can be noted when its influence on POE was examined independently; whites were superior to black expressors in overall accuracy scores and the patterning of correct perception. Perhaps, as Klineberg (1935) pointed out, the expression of emotion by the black man is not a desirable attribute. These findings were consistent when the emotions were examined individually; whites were superior in the expression of anger, surprise, fear and sadness, but the black expressor was judged more accurately for pain. This finding supports Kozel and Gitter's (1968) recent results concerning black females superiority in the expression of pain, which in turn might be used to support Drag and Shaw's (1967) contention that emotional expression is a function of practice. If, indeed, black emotional expression is undesirable, and the expression of emotion in general is a function of practice, it might be anticipated that the part of the emotional spectrum under consideration which the black is "allowed" to express

would be the one with which he is most familiar. The experience of the black man in America may be characterized, at least, as painful.

The greater incidence of the accurate perception of pain when expressors were black, was complemented by the findings for the erroneous perception of emotion in terms of race of expressor. Blacks were judged erroneously as expressing anger, disgust, and sadness more often than whites. Kozel and Gitter (1968), observing a similar incidence of erroneous perception of black expression of anger, argued that current events concerning racial issues has created an awareness, forced almost to the point of caricature, of the emotional status of black America, i.e., that it is angry. Such an argument might also account for the erroneous perception of black expressors as sad and disgusted. Recent racial turmoil has not only caused an awareness of black militancy, but has created a mass consciousness of the black man's feeling of disgust.

Sex of expressor consistently influenced POE in terms of overall correct scores and the patterning of the perception of the various emotions. This variable also had an effect upon the erroneous perception of emotion. Males had higher erroneous perception scores than females. Furthermore, females were superior in total correct POE as well as in the expression of the individual emotions of anger, surprise, and fear. This latter result is consistent with an earlier finding (Gitter and Black, 1968) that female

expressors accounted for higher scores than males in their enactment of anger, surprise and fear. Such findings as the above tend to support Jenness' (1932) assertion that the addition of female expressors may have an effect upon the distribution of scores. In addition, Drag and Shaw (1967) found females to be superior as expressors of anger and fear. The latter phenomenon is one which they ascribe to the belief that expression of anger and fear are characteristic of the female role.

Race of perceiver was a significant variable in terms of overall POE, and in the judgment of disgust. Black perceivers were significantly better judges of emotion than their white counterparts. Race of perceiver was also a significant influence on the erroneous perception of emotion; white perceivers were responsible for more erroneous POE than blacks. These findings support earlier results of Gitter and Black (1968) which found black perceivers superior to whites in correct POE whereas white perceivers account for more erroneous POE than their black counterparts.

The observation of race differences in POE is similar to (Dickey and Knower, 1941) findings of national differences in the ability to perceive emotion. Dickey and Knower (1941) when they found Mexican youths superior to Americans in POE, suggested that there are differing cultural sensitivities to emotional nuances. This speculation might be extended to a

consideration of the black man in America. It is suggested that the history of the subservience of the black man in the United States (Kozel and Gitter, 1968) is responsible for subcultural differences in perception, perhaps to the extent that blacks are more "sensitive to the communicative symbols of action" (Dickey and Knower, 1941).

Sex of perceiver was not found to be a significant variable. This finding adds support to the results of investigations of Allport (1924), Sherman (1927), Guilford (1929), and Gitter and Black (1968), while contradicting those of Buzby (1924), Kanner (1931), and Kozel and Gitter (1968). The extent to which this finding would remain viable in the light of the results of earlier research might be explained in terms of contemporary role relationships. In other words, there are current traditional restrictions operating upon the behavior of males and females. The male is expected to be less emotional. Consequently, females are better, i.e., more suitable, expressors of emotion. However, as this, and other (Allport, 1924; Sherman, 1927; Guilford, 1929; and Gitter and Black, 1968) investigations report, males are equal to females in their ability to perceive emotion. Thus, although there are restrictions on the expressive behavior of males, there appears to be no restrictions on the males' perceptual sensitivities.

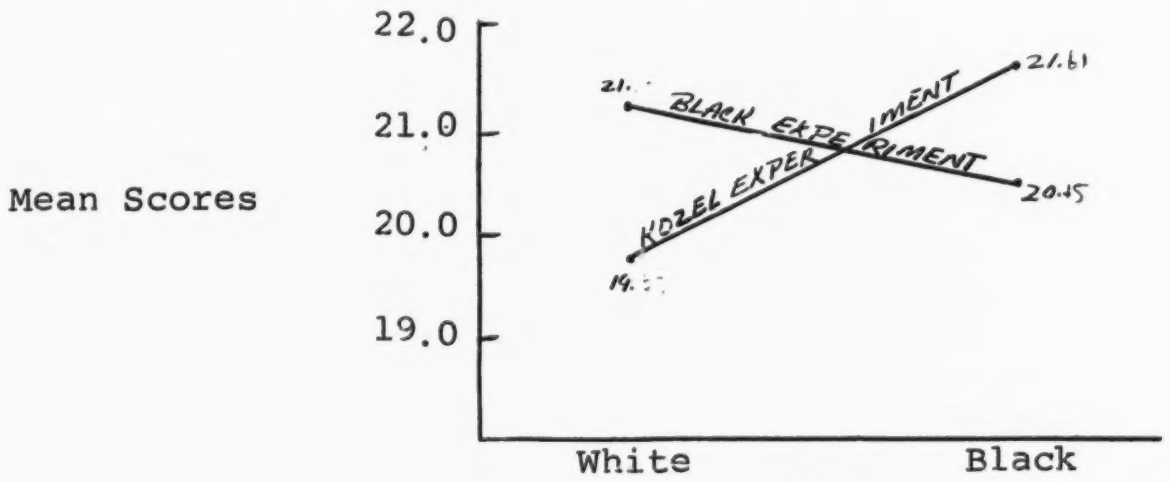
A mention should be made of some differences between the results of Kozel and Gitter's (1968) study and those from the present investigation, especially since both of these two experiments share an overlap involving stimuli materials (still photographs) and two independent variables (R of E and S of P). Total correct scores for black and white female expressors as judged by white male and female perceivers represents the area of overlap between this and Kozel and Gitter's (1968) study.

A separate analysis to compare the overlapping portions of the data from Kozel and Gitter's (1968) experiment and this study was performed. A 2x2 Anova of the overlapping portion of the data from this study, employing total correct scores as DV, yielded nonsignificant main effects for race of expressor ($F=0.283$, $df=1/36$, N.S.) and sex of perceiver ($F=0.687$, $df=1/36$, N.S.), and nonsignificant interaction ($F=0.087$, $df=1/36$, N.S.). However, a similar analysis of the corresponding portion of Kozel and Gitter's (1968) data, while yielding a nonsignificant main effect for sex of perceiver ($F=3.175$, $df=1/48$, N.S.) and a nonsignificant interaction (R of E x S of P--$F=0.760$, $df=1/48$, N.S.), yielded a significant main effect for race of expressor ($F=5.367$, $df=1/48$, $p<.05$)--black female expressors were superior to white female expressors in their enactments of emotions. In addition a 2x2x2 Anova (Kozel vs. Black x R of E x S of P), again using total correct scores as DV, was performed. Its results indicated nonsignificant main

effects for the three independent variables (main effect for Kozel vs. Black--F=0.120, df=1/84, N.S.; main effect for R of E--F=0.677, df=1/84, N.S.; main effect for S of P--F=3.941, df=1/84, N.S.) and a significant interaction--R of E x Kozel vs. Black (F=4.399, df=1/84, p<.05) (see Figure 15). This last result reflects previously noted superiority of black female expressors in the Kozel study.

FIGURE 15

Race of Expressor x Kozel vs. Black



A difference between the two studies in their respective modes of presentation of stimuli should be noted; it may very well account for the discrepancy between their corresponding results. As Kozel and Gitter (1968, p. 29) pointed out, "The accurate perception of any particular emotion is contingent upon its mode of presentation." While still photographs were used as stimuli in both studies, Kozel and Gitter presented the stimuli to groups of Ss via a projector, while the Ss in this study were tested individually making judgments after inspecting the actual photograph.

As with other investigations of POE (Kellogg and Eagleson, 1931; Woodworth, 1938; Davitz, 1964; Kozel and Gitter, 1968; and Gitter and Black, 1968) the various emotions are not equally identifiable; happiness and pain are responsible for the highest, while fear and sadness the lowest proportion of correctly perceived emotion. These results are comparable to recent findings of Gitter and Black (1968); both investigations are in agreement with the patterning of correct POE as well as the erroneous judgment of emotion in which fear, pain and sadness are responsible for the smallest proportion of erroneous POE.

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APPENDIX A

This study is being conducted by the Communication Research Center of Boston University.

You will be given seven slips of paper, each listing a different emotional state. You may arrange the slips in front of you in any convenient manner. You will then be shown a number of people in one of the seven emotional states. You are to identify the particular emotion in each picture shown from one of the seven given slips of paper.

Although at times you may be uncertain, you must choose one emotion from among the seven given on the slips of paper. After you see the picture you will give your response as rapidly as possible. Please do not mull over any one case for we are interested in your first impression. Since the people you see are part of a larger group of cases, from which they have been randomly chosen, do not expect a logical pattern or any particular sequence for any person or emotion.

APPENDIX B

Name_____ Address_____

_____

Phone_____Age_____ Occupation_____

R of E_____ S of E_____R of S_____S of E_____

_____1._____

_____2._____

_____3._____

_____4._____

_____5._____

_____6._____

_____7._____

_____8._____

_____9._____

_____10._____

_____11_____

_____12._____

_____13._____

_____14._____

_____15._____

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_____26._____

_____27._____

_____28._____

_____29._____

_____30._____

_____31._____

_____32._____

_____33._____

_____34._____

_____35._____

APPENDIX C

Summary Anova and Mean Tables

TABLE A

R of E x S of E x R of P x S of P

Overall Accuracy

Source	df	MS	F
A (R of E)	1	78.400	7.127
B (S of E)	1	193.600	17.600
C (R of P)	1	70.225	6.384
D (S of P)	1	27.225	2.472
AB	1	12.100	1.100
AC	1	1.225	0.111
AD	1	0.625	0.056
BC	1	70.225	6.384
BD	1	7.225	0.656
CD	1	2.500	0.227
ABC	1	1.225	0.111
ABD	1	75.625	6.875
ACD	1	3.600	0.327
BCD	1	0.900	0.081
ABCD	1	244.950	22.268
Error	144	10.991	

TABLE B

Correct Perception of Emotion

Source	df	MS	F
A (R of E)	1	10.608	6.567
B (S of E)	1	26.722	16.543
C (R of P)	1	10.608	6.567
D[1] (Emotions)	6	121.933	127.641
AB	1	1.501	0.929
AC	1	0.258	0.160
AD	6	4.656	4.874
BC	1	9.472	5.864
BD	6	33.416	34.980
CD	6	0.543	0.569
ABC	1	0.258	0.160
ABD	6	7.365	7.710
ACD	6	1.831	1.917
BCD	6	1.203	1.264
ABCD	6	160.933	168.468
Error (between Ss)	152	1.615	
Residual (within Ss)	912	0.955	

---

1 Repeated measures

TABLE C

Correct Perception of Emotion

Source	df	MS	F
A (R of E)	1	10.608	6.452
B (S of E)	1	26.722	16.252
C (S of P)	1	3.544	2.155
D[1] (Emotions)	6	121.933	125.436
AB	1	1.501	0.913
AC	1	0.044	0.027
AD	6	4.656	4.790
BC	1	1.222	0.743
BD	6	33.416	34.376
CD	6	0.304	0.313
ABC	1	11.401	6.934
ABD	6	7.365	7.577
ACD	6	0.642	0.660
BCD	6	0.416	0.428
ABCD	6	160.601	165.216
Error (between Ss)	152	1.644	
Residual (within Ss)	912	0.972	

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1 Repeated measures

TABLE D

Anger Correctly Perceived

Source	df	MS	F
A (R of E)	1	5.625	5.617
B (S of E)	1	8.100	8.089
C (R of P)	1	0.625	0.624
D (S of P)	1	0.225	0.224
AB	1	14.400	14.380
AC	1	2.025	2.022
AD	1	0.625	0.624
BC	1	10.000	9.986
BD	1	0.100	0.099
CD	1	0.225	0.187
ABC	1	0.100	0.100
ABD	1	4.900	4.895
ACD	1	2.025	2.022
BCD	1	1.600	1.539
ABCD	1	8.425	8.416
Error	72	1.001	

TABLE E

Happiness Correctly Perceived

Source	df	MS	F
A (R of E)	1	0.056	0.109
B (S of E)	1	0.056	0.109
C (R of P)	1	0.156	0.302
D (S of P)	1	0.306	0.592
AB	1	0.306	0.592
AC	1	1.056	2.042
AD	1	0.006	0.011
BC	1	0.056	0.109
BD	1	0.056	0.109
CD	1	0.306	0.591
ABC	1	2.256	4.361
ABD	1	0.056	0.109
ACD	1	0.756	1.462
BCD	1	0.506	0.978
ABCD	1	0.475	0.918
Error	72	0.517	

TABLE F

Surprise Correctly Perceived

Source	df	MS	F
A (R of E)	1	11.556	11.613
B (S of E)	1	79.806	80.196
C (R of P)	1	1.406	1.413
D (S of P)	1	0.506	0.508
AB	1	0.306	0.308
AC	1	0.006	0.006
AD	1	0.756	0.759
BC	1	0.156	0.157
BD	1	2.256	2.267
CD	1	0.506	0.508
ABC	1	1.806	1.815
ABD	1	1.056	1.061
ACD	1	1.806	1.815
BCD	1	0.006	0.006
ABCD	1	85.325	85.753
Error	72	0.995	

TABLE G

Fear Correctly Perceived

Source	df	MS	F
A (R of E)	1	7.225	7.918
B (S of E)	1	112.225	122.986
C (R of P)	1	2.500	2.740
D (S of P)	1	0.025	0.027
AB	1	0.400	0.438
AC	1	5.625	6.164
AD	1	0.400	0.438
BC	1	0.225	0.247
BD	1	0.000	0.000
CD	1	0.225	0.247
ABC	1	0.000	0.000
ABD	1	1.225	1.341
ACD	1	1.600	1.752
BCD	1	0.000	0.000
ABCD	1	112.475	123.192
Error	72	0.913	

TABLE H

Disgust Correctly Perceived

Source	df	MS	F
A (R of E)	1	0.025	0.019
B (S of E)	1	10.000	7.676
C (R of P)	1	7.225	5.546
D (S of P)	1	0.400	0.306
AB	1	16.900	12.972
AC	1	0.025	0.019
AD	1	0.900	0.690
BC	1	4.900	3.761
BD	1	0.625	0.479
CD	1	1.600	1.227
ABC	1	0.100	0.077
ABD	1	5.625	4.316
ACD	1	0.400	0.306
BCD	1	0.625	0.479
ABCD	1	11.250	8.633
Error	72	1.303	

TABLE I

Pain Correctly Perceived

Source	df	MS	F
A (R of E)	1	6.400	5.364
B (S of E)	1	11.025	9.241
C (R of P)	1	0.900	0.754
D (S of P)	1	3.600	3.017
AB	1	13.225	11.085
AC	1	2.500	2.095
AD	1	0.900	0.754
BC	1	0.625	0.524
BD	1	0.625	0.524
CD	1	0.100	0.083
ABC	1	0.025	0.021
ABD	1	0.025	0.021
ACD	1	0.400	0.335
BCD	1	1.225	1.026
ABCD	1	16.475	13.809
Error	72	1.193	

TABLE J

Sadness Correctly Perceived

Source	df	MS	F
A (R of E)	1	7.656	5.751
B (S of E)	1	6.006	4.512
C (R of P)	1	1.056	0.793
D (S of P)	1	0.306	0.229
AB	1	0.156	0.117
AC	1	0.006	0.005
AD	1	0.306	0.229
BC	1	0.756	0.568
BD	1	0.056	0.042
CD	1	0.756	0.568
ABC	1	2.756	2.070
ABD	1	3.306	2.483
ACD	1	1.406	1.056
BCD	1	0.156	0.117
ABCD	1	6.525	4.902
Error	72	1.331	

TABLE K

Erroneous Perception of Emotion

Source	df	MS	F
A (R of E)	1	11.001	6.817
B (S of E)	1	27.972	17.335
C (R of P)	1	10.222	6.335
D[1] (Emotions)	6	97.522	42.260
AB	1	1.501	0.930
AC	1	0.108	0.067
AD	6	7.576	3.283
BC	1	9.472	5.870
BD	6	20.843	9.032
CD	6	2.172	0.941
ABC	1	0.151	0.094
ABD	6	5.218	2.261
ACD	6	3.221	1.396
BCD	6	7.489	3.245
ABCD	6	124.082	53.770
Error (between Ss)	152	1.614	
Residual (within Ss)	912	2.308	

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1 Repeated measures

TABLE L

Erroneous Perception of Emotion

Source	df	MS	F
A (R of E)	1	11.001	6.707
B (S of E)	1	27.972	17.053
C (S of P)	1	4.008	2.444
D[1] (Emotions)	6	97.522	41.950
AB	1	1.501	0.915
AC	1	0.044	0.027
AD	6	7.576	3.259
BC	1	0.858	0.523
BD	6	20.843	8.966
CD	6	2.341	1.007
ABC	1	11.001	6.707
ABD	6	5.218	2.244
ACD	6	1.915	0.824
BCD	6	3.433	1.477
ABCD	6	126.682	54.494
Error (between Ss)	152	1.640	
Residual (within Ss)	912	2.325	

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1 Repeated measures

TABLE M

R of E x S of P -- Black Experiment

Total Correct

Source	df	MS	F
A (R of E)	1	3.26	0.283
B (S of P)	1	7.913	0.687
AB	1	1.000	0.087
Error	36	11.518	

TABLE N

R of E x S of P -- Kozel Experiment

Total Correct

Source	df	MS	F
A (R of E)	1	46.700	5.367
B (S of P)	1	27.623	3.175
AB	1	6.614	0.760
Error	48	8.701	

TABLE O

R of E x S of P x Black vs Kozel

Total Correct

Source	df	MS	F
A (Kozel vs Black)	1	1.177	0.120
B (R of E)	1	6.642	0.677
C (S of P)	1	38.686	3.941
AB	1	43.181	4.399
AC	1	0.666	0.068
BC	1	0.184	0.019
ABC	1	9.082	0.925
Error	84	9.816	

TABLE P

Perception of Emotion: Means of Total Correct

Expressors -- Actors

Perceivers Ss			W		B			
			M	F	M	F		
W	M		20.7	21.6	19.6	22.0	20.9	21.7
	F		21.0	21.6	24.5	23.4	22.6	
B	M		19.3	18.4	19.6	18.8	19.0	20.3
	F		19.6	21.3	21.2	25.0	21.7	
			20.1	20.7	21.2	22.3		
			20.4		21.7			

W = White
B = Black
M = Male
F = Female

	M	F
Expressors	20.6	21.5
Perceivers	19.9	22.1